DOCUMENT RESUME

ED 147 484 CE 013 257

TITLE	Pilot Course in Century 21 Shorthand. Fourth Semester. An Evaluation of the Project. Final Report.
INSTITUTION	New Mexico State Univ., Las Cruces.
BUREAU NO	NMSU-76-0004
PUB DATE	Jun 77
NOTE	23p.; For related documents see CE 013 254-257
EDRS PRICE	MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS	*Academic Achievement; Bilingual Students; Business Subjects; Comparative Analysis; Educational Research; Ethnic Groups; Evaluation; Mathematics; Methods Research; Minority Groups; Office Practice; Performance; Performance Criteria; Performance Tests; Predictor Variables; *School Holding Power; *Spanish Speaking; *Stenography; *Teaching Methods; Vocational Education
IDENTIFIERS	*Century 21 Shorthand; *Gregg Shorthand; New Mexico

ABSTRACT

An evaluation project conducted at Dona Ana County Occupational Education Branch of New Mexico State University was designed to compare the effectiveness of Century 21 with Gregg Shorthand. Two classes of shorthand students were set up as experimental groups (due to student attrition, two more groups were added during the third semester). Their performance was assessed for four semesters based on the following performance measures: dictation speed, scores on theory tests, scores on brief form tests, and overall average grades. In addition, survival rates of students with different ethnic and language backgrounds were studied. After the fourth semester, the overall results indicated that: Gregg and Century 21 are equally successful methods in teaching shorthand to college students; Century 21 students take shorthand at higher speeds; Century 21 does not appeal to minority students or bilingual students any more than Gregg does; students with higher American College Testing (ACT) math scores are more successful in both shorthand courses than those students with low ACT math scores while English ACT and overall ACT scores show less of an influence on shorthand success. (The appendixes of this document include excerpts from the previous semester evaluations and a bibliography on shorthand prognosis. Results of the first, second, and third semester evaluations are reported in separate documents.) (BM)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED147484

An Evaluation of the Project:

PILOT COURSE IN CENTURY 21 SHORTHAND

Final Report

Fourth Semester
June 1977

Project Proposal #NMSU 76-0004

DACOEB Secretarial Administration Program

New Mexico State University

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Eleanor Heins

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Miss Eleanor Ann Heins, Director of Project
Instructor, Century 21 Shorthand

Ms. Eileen DeDea, Instructor, Gregg Shorthand

Dr. Theodore G. Brough, Consultant Statistician
Western Research and Evaluation Center
Las Cruces, New Mexico 88003

CE 013 257

INTRODUCTION

In the Fall Semester of 1975, an experimental project in shorthand was begun. The purpose was to compare the effectiveness of Century 21 Shorthand (a new method published by Southwestern Publishing Company) with Gregg Shorthand. Two classes of shorthand students were set up as experimental groups: 35 students in Century 21 and 26 students in Gregg. The intention was to follow their performance for four semesters. The performance measures used were:

Dictation Speed
Scores on Theory Tests
Scores on Brief Form Tests
Overall Average Grades

In the first two semesters, Gregg students exhibited a slight superiority in Dictation Speed and in Brief Forms, while Century 21 students were slightly superior in Theory Tests and Final Average Grade in the first semester and not in the second. Century students had better retention in the first semester, while Gregg students had better retention in the second. In addition to these, the survival rates of students with different ethnic and language backgrounds were studied.

Additional information was gathered on each student for further analysis via multiple regression. This information was gathered in the following forms:

Biographical Information
Career Education Description Questionnaire
Background Information Questionnaire
Background and Study Habits Questionnaire
ACT Scores as recorded in University Files
Teachers' Summary of Performance (Grade Book)

Analysis of the data gathered on these forms, coupled with the shorthand performance tests, seems to indicate that for Gregg students at least, the sets of data from the first five questionnaires listed above are apparently independent (with some exceptions) of performance in the shorthand course--first (and second) semesters. However, for Century students the factor analysis indicates some important relationships between these variables and shorthand performance. This result may be indicative of the characteristics of the students enrolled in Century 21, that is; minority students of an adventurous type with generally low ACT scores, but with some having had some shorthand experience previously. In any case, because of attrition, this type of analysis was not continued beyond the second semester. The results of these background studies are listed in the first two reports in the series.

Heins, DeDea, Brough, Strange and Brown, AN EVALUATION OF THE PROJECT: PILOT COURSE IN CENTURY 21 SHORTHAND, DACOEB, New Mexico State University, Las Cruces, NM 88003, February, 1976.

Heins, DeDea, and Brough, AN EVALUATION OF THE PROJECT: PILOT COURSE IN CENTURY 21 SHORTHAND, Second Semester, DACOEB, New Mexico State University, Las Cruces, NM 88003, July, 1976.

Although during the first two semesters Century apparently appealed more (had a higher holding power--that is, more successful students) to minority students and those with a foreign language than did Gregg, by the third and fourth semesters this advantage was wiped out.

In order to get sufficient numbers of students to perform analyses, additional Gregg students were added to the Gregg group. In the analyses these students were treated separately, however, and the real comparisons were between the original Gregg survivors and the Century 21 survivors. Since the numbers were so small at the end of the fourth semesters (4 Gregg students, 5 Century students) the results cannot be considered significant. Examining the trends during the four semesters of the experiment does indicate what is happening, however. The overall results are:

Gregg and Century 21 are about equally successful methods in teaching shorthand to college students.

Century 21 students take shorthand at higher speeds than do Gregg students.

Century 21 does not appeal to (have higher retention rates) minority students or students with a foreign language at home to any more extent than does Gregg.

Students with higher ACT Math scores are apparently more successful in both shorthand courses than are those with low ACT Math scores. English ACT and Overall ACT scores show less of an influence on Shorthand success.

Details of the findings in the last semester (with some reference to previous semesters) are given in the remainder of this report. The complete set of reports, one for each semester, will be available from the Educational Research Information Center (ERIC). A limited number of copies of the previous reports are available from New Mexico State University, DACOEB. Please see the address given at the end of this report.

CENTURY 21 vs. GREGG: THE FIRST FOUR COLLEGE SEMESTERS

1. Although Century 21 instruction does not produce higher proportions of successes among students who speak a foreign language (one Spanish speaking student survived four semesters of instruction and that one is in the Gregg course), there is some evidence that Century 21 was more successful with minority students than was Gregg among those students with low ACT English scores. The differences, though significant, are not really believable because of the extremely small number of students involved in the sub-set (N=4).

2. The attrition rate in Century 21 is about the same for Century as for Gregg after four semesters (Century having a slight advantage in the first semester).

3. Century 21 students take dictation at slightly higher speeds than do Gregg students after four semesters. This difference is not significant, however.

Since the number of surviving members in the original experimental groups is so small (4 for Gregg, 5 for Century) additional fourth semester students had to be considered in order to have meaningful statistics. Hence, 5 Gregg students were added to the Gregg class, which now consists of 4 groups: the original experimental group (N=5), the group joining Gregg and staying for three semesters (N=4), the group joining Gregg for two semesters (N=9), and a group joining Gregg for one semester (N=5). These groups were compared with the surviving members in the Century 21 group (N=5). The final experimental number, N=28, was barely sufficient to make comparisons between groups, provided that a multiple comparison method was used: analysis of variance (ANOVA). Indeed, in order to do any comparisons involving high and low ACT's, minorities vs. others, etc. Gregg group 2 (N=9) had to be combined with Gregg group 1 (N=3). This was done for most of the ANOVA analyses.

HOLDING POWER

The proportions of successful students in Century 21 and Gregg during the fourth semester were as follows: success = C- or better at the end of the term. Most students receiving an imcomplete, if performing satisfactorily but not finishing were given C grades (one of these was given a D). The success ratios are:

GREGG 4	GREGG 3	GREGG 2	GREGG 1	CENTURY
4/5 = 80.%	4/4 = 100.%	8/9 = 88.9%	3/5 = 60.%	5/5 = 100.%

(Gregg 4 is the group of Gregg students taking four semesters of college Gregg as the original experimental group.

Gregg 3 is the group of Gregg students joining the experiment after one semester and taking three semesters of college Gregg with the experimental group.

Gregg 2 is the group of Gregg students joining the experiment after two semesters and taking two semesters of college Gregg with the experimental group.

Gregg 1 is the group of Gregg students joining the experiment after three semesters and taking one semester of college Gregg with the experimental group.

Century is the group of students taking Century 21 for four semesters in this experiment.)

The proportion of successful students for the four semesters is as follows (in percent):

SEM	GR-4	GR-3	GR-2	GR-1	CENTURY
THIS	4/5 = 80.	4/4 = 100.	8/9 = 88.9	3/5 = 60.	5/5 = 100.
ONE	11/26 = 42.3	10/12 = 83.3	10/14 = 71.4		18/35 = 51.4
TWO	6/26 = 23.1	5/12 = 41.7	8/14 = 57.1		8/35 = 22.9
THREE	4/26 = 15.4	4/12 = 33.3			5/35 = 14.3
FOUR	4/26 = 15.4				5/35 = 14.3

The proportion of successful students among minorities is (in percent):

SEM	GR-4	GR-3	GR-2	GR-1	CENTURY
THIS	2/2 = 100.	1/1 = 100.	3/3 = 100.	2/4 = 50.	2/2 = 100.
ONE	5/14 = 35.7	1/2 = 50.	3/5 = 60.		8/16 = 50.
TWO	3/14 = 21.4	1/3 = 33.3			4/16 = 25.
THREE	2/14 = 14.3				2/16 = 12.5
FOUR	2/14 = 14.3				2/16 = 12.5

The proportion of successful students among those who speak a foreign language at home is (in percent):

SEM	GR-4	GR-3	GR-2	GR-1	CENTURY
THIS	1/2 = 50.	2/2 = 100.	1/1 = 100.	1/1 = 100.	0 = 0
ONE	5/13 = 38.5	1/2 = 50.	2/4 = 50.		6/13 = 46.2
TWO	2/13 = 15.4	1/3 = 33.3			2/13 = 15.4
THREE	1/13 = 7.7				0/13 = 0
FOUR	1/13 = 7.7				0/13 = 0

The proportion of successful students among those English only students (which includes some Spanish-Americans as well as other minorities) is (in percent):

SEM	GR-4	GR-3	GR-2	GR-1	CENTURY
THIS	3/3 = 100.	2/2 = 100.	7/8 = 87.5	2/4 = 50.	5/5 = 100.
ONE	6/13 = 46.2	9/10 = 90.	8/10 = 80.		12/22 = 54.5
TWO	4/13 = 30.8	4/10 = 40.			6/22 = 27.3
THREE	3/13 = 23.1				5/22 = 22.7
FOUR	3/13 = 23.1				5/22 = 22.7

DICTATION SPEED

In speed of dictation it is fairly obvious that the Century 21 group of students is superior to any of the Gregg groups, that is all of the surviving Century 21 students took dictation at 120 wpm while the maximum proportion of the Gregg students was 50% at 120 wpm. The comparative speeds of the students in shown in Table I.

TABLE 1

NUMBER OF STUDENTS ATTAINING DICTATION

SPEEDS (95% accuracy) ON ONE OR MORE TESTS

SPEED (WPM)	GR-4 N	%	GR-3 N	%	GR-2 N	%	GR-1 N	%	CENTURY N	%
90					(2)*	25.				
100	(2)*	40.	(2)*	50.	1	12.5	(2)*	40.		
110	1	20.	1	25.	1	12.5	1	20.		
120	2	40.	1	25.	4	50.	2	40.	5	100.
TOTALS	5	100.	4	100.	8	100.	5	100.	5	100.

*Number in parentheses indicates the number of students achieving that speed of dictation in a short mailable letter, even though they did not attain that speed in a 3 minute dictated letter in this semester.

N=28 all who started
N=26 (those who had all tests and survived)

ANALYSIS OF VARIANCE

There are now five groups of students: Gregg -1, -2, -3, -4, and Century. The Gregg -1, -2, -3, -4 students were in the experiment for 1, 2, 3 or 4 semesters, respectively; the Century group was in the experiment for three semesters. One-way analyses of variance were performed dividing the students into the five groups, into minorities and anglos, plus splitting the Gregg and Century groups into high and low achievement sub-groups based on achievement on ACT tests:

English ACT (low = 1-18, high = 19+)

Math ACT (low = 1-12, high = 13+)

Overall ACT (low = 1-14, high = 15+)

These cut points are similar to the cut points used in the previous three reports of this series. The chosen cut points assure a minimum of two students in each cell. Since the total number of students was so small (N=26) two-way analyses of variance were not possible, hence a large number of one-way analyses of variance were performed (62) utilizing the divisions described above and the measures:

Dictation Speed (Average of all test, in wpm)

Word Tests (Average of 3 highest, in percent)

Speed Form Tests (Average of 4 highest, in percent)

Homework Grades (Letter grades converted to numbers where A = 11, A- = 10, ... D = 2, D- = 1)

Overall Grades (Letter grades converted to numbers where A = 11, A- = 10, ... D = 2, D- = 1)

as dependent variables. In all analyses groups GR-2 and GR-3 were combined into one group (GR-2 had N of only 3).

The results of the 62 ANOVA analyses (so using the shorthand performance measures as dependent variables and 12 using the ACT attainment as dependent variables) are listed below:

1. Century 21 students are usually equivalent to Gregg -4 students in most analyses involving shorthand performance and ACT attainment as dependent variables. Differences usually could not be detected.

2. However, Century 21 students and Gregg -1 and -2 students were found significantly superior to Gregg -3 and -4 students in the analysis involving Homework as the dependent variable. This same difference was found for the subdivision of students with high ACT math scores but not for the low ACT math groups.

3. When the students were divided into low and high English ACT groups, the Century 21 and Gregg -1 and -2 students among the low English ACT were found superior ($P<.05$) to the Gregg -3 and -4 students when dictation speed is taken as the dependent variables. No significant differences in performance were found for any performance measures when low ACT English groups were compared with high ACT English groups.

4. Among the minority students, only the Century 21 and Gregg -1 and -2 students were found significantly superior to the Gregg -4 students when dictation speed and grade on speed forms were used as the independent variables.

5. When the minority students as a whole (Spanish, Black) were compared with anglo students (others) as a whole, no shorthand performance measures showed to be significantly different.

6. However, when ACT scores were used as the performance measures, the anglo students proved to have significantly higher English, math, and overall ACT scores. ($P<.01$ for English and overall, ($P<.05$ for math).

The conclusions to be drawn from the above discussion are these: In general, Century 21 students perform equivalently to Gregg students after taking four semesters of shorthand. If we focus our attention on minority students only, we find that Century 21 students are equilvalent in shorthand performance to Gregg students and in some measures (dictation speed and grade on speed forms) are superior to the experimental group of Gregg students (see paragraph 4, above). An examination of Table 1 shows somewhat the same thing: Century 21 students outperform Gregg students on dictation speed. However, because of the small number of students in the Century 21, and Gregg -4 groups, (5 in each group, 2 minority members in each group) the differences observed cannot be called typical or significant. We cannot call either Century 21 or Gregg superior to each other in shorthand performance measures. The holding power for Gregg and for Century 21 are virtually the same, with Gregg having a slight edge in holding foreign-language-at-home students (again, beware of conclusions based on very small numbers of subjects).

SUMMARY AND CONCLUSIONS

In looking over the results of this experiment where a class of Century 21 students was followed for four college semesters of shorthand instruction and compared with the performances of a class of Gregg students, we find that Century 21 held a slight advantage over Gregg in three out of five measures of performance at the beginning and four out of five performance measures at the end. As far as foreign language speakers and minorities are concerned.

Century 21 had an initial advantage in retention, but lost that advantage in the third semester (minorities) or in the fourth semester (foreign language speakers). The differences observed are generally not significant statistically, so the best we can say is that performance in shorthand is about the same throughout the four semesters in the two courses, with speed of dictation after four semesters being the only clear advantage for Century 21 students over Gregg students.

A summary of the performance measures for the various groupings over the four semesters is shown in Table 2.

TABLE 2

Summary of Four Semesters: Century 21 vs. Gregg

Experimental Measure	Groupings Considered											
	OVERALL*				MINORITIES				FOREIGN LANGUAGE SPEAKERS			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Retention	+	-	+	+	+	+	+	0	+	+	-	-
Dictation	-	-	+	+								
Theory Tests	+	-	0	0								
Brief Forms	-	-	-	+								
Final Average	+	-	0	+								

*I, II, III, IV refers to semesters in the sequence.

+ = Favors Century 21
- = Favors Gregg
0 = Favors neither Gregg nor Century

These differences are not necessarily significant in a statistical sense. Generally they are not.

APPENDIX A

Analysis of Century 21 Speed Forms and Gregg Brief Forms Vocabulary Tests, First Semester, Fall 1975.

Toward the end of the first semester of instruction in the two shorthand courses, a series of four vocabulary dictation tests were given in order to test the command of the students over Speed Forms (Century 21) or Brief Forms (Gregg), that is, high frequency forms based on vocabulary counts. Error data was gathered on 22 Century students and 18 Gregg students. Those words in each test that were missed by 20% or more of the students were tabulated by number of misses in the following manner:

Misses by --

1. The group as a whole.
2. Minority members (Spanish, Indian, Black) vs. non-minority members (essentially Anglo)
3. Foreign language speakers vs. non-speakers

The following table compares the number of errors made by the various sub-groups for the two shorthand methods. The errors tabulated are the total errors for those words missed by 20% or more of the Gregg or Century 21 populations.

Table A-1 indicates for Century 21 that minority students and students who speak a foreign language at home make more errors (in proportion of their representation) than do non-minorities and non-foreign language speakers. For Gregg, the situation is somewhat reversed: Non-minorities make more errors than do minorities. For foreign language speakers or non-speakers there is no perceptible difference. These results seem to differ from the results reported in the first semester (see Heins, et al., February, 1976, Pilot Course in Century 21). However, the conclusions to that study reported some slight advantages for Century 21 holding power (fewer dropouts) among minorities, with practically no difference in that measure among students who speak a foreign language. No differences showed up when Brief Form performance was used as a measure. The present analysis addresses itself to the question of specific word errors and who makes them.

Of the Century 21 Speed Forms most commonly missed by minorities and by those speaking a foreign language, four have the hard k sound at the beginning of a word; quality, construct, convenience, quantity, while three end in a consonant: regular, attention, importance. Of the Brief Forms most commonly missed by minorities and by those speaking a foreign language, four begin with the letter p and end with a consonant or an unpronounced vowel: public, probable, purpose, publications; while four start with a vowel, one having a consonant voicing: importance, opinion, ordinary, and use. A clue here is, perhaps a difficult voicing of the beginning and ending

of these words which led to misunderstanding among those with a weak command of English. For a complete listing of the Speed Forms of Century 21 and the Brief Forms of Gregg used in the first semester, as well as a list of most frequently missed words on each test trial (missed by 20% or more of the students in each section) write to:

Miss Eleanor Ann Heins
Director of the Project:
Pilot Course in Century 21 Shorthand
Dona Ana County Occupational Education Branch
New Mexico State University
Las Cruces, New Mexico 88003

TABLE A-1

SHORTHAND METHOD	Total Errors Made by: Total Group	Min.	Non-Min	Foreign Lang.	Non-For. Lang.
Century 21	(N=84)*	(N=39)	(N=45)	(N=27)	(N=57)
	100%	46.4%	53.6%	32.1%	67.9%
	150**	87	63	62	88
	100%	68%	42%	41.3%	58.7%
Error Ratio	-	+***	-	+	-
Gregg	(N=66)	(N=35)	(N=31)	(N=38)	(N=28)
	100%	53%	47%	57.6%	42.4%
	261	108	153	152	109
	100%	41.4%	58.6%	58.2%	41.8%
Error Ratio	+	-	+	=	=

*Indicates the number of subjects taking the tests (4 tests, hence the number of subjects approximates four times the total subjects in each group with occasional absences). The percentage immediately below the N is the proportion of the total represented.

**Indicates the number of errors made by the group or sub-group. The percentage immediately below this number is the proportion of the total represented.

***Plus (+) or minus (-) indicates that errors are made in greater (or lesser) proportion to the representation in the group. Hence, minorities in Century 21 (46.4% of the Century group) make 68% of the errors and are marked with a +. If there is no difference (or only a fraction of a percent difference) an equal (=) sign is entered in the table.

APPENDIX B

Appendix B gives a discussion of the previous research in the study of shorthand success. The paragraphs given and the bibliography are lifted from a previous report in this series called: AN EVAULATION OF THE PROJECT: PILOT COURSE IN CENTURY 21 SHORTHAND, Second Semester, July 1976, by Eleanor Ann Heins, Eileen DeDea, and Theodore G. Brough.

"In the first semester study (Heins, et al., 1976) Mathematics ACT was found to be a significant variable in dictation performance and overall performance. This is in line with the results of Balsley (1975), Holderness (1976), and Handorf (1973), perhaps because the first semester emphasizes learning the shorthand symbols. For the second semester, Mathematics ACT was no longer important as a predictor; the emphasis has shifted to transcription where English skills are more important [Curley (1974), Kinsey (1970), Lambrecht (1972), Moskovis (1969), Reid (1974), Tronsue (1969), Utley (1972), West (1971)]. Although English ACT did not show up as a significant variable in the ANOVA studies for the first semester, and only in one case (Brief Forms) in the second semester, its high importance in the Regression equations in both the first and second semesters indicates that it should always be considered. [National Secretaries Association (International), 1973]."

"Previous research on using psychological, aptitude or attitude tests to predict successful students in shorthand have met with mixed success. Balsley (1975) cites some work with Wechsler scales where dictation ability is related to subtests of the WAIS. Other studies have given good marks to the Turse Aptitude Test [Curley (1971), Gallion (1971), Lambrecht (1972), and O'Connell (1968)], while Byers and Allyn's or the ERC stenographic test also are useful. [Gallion (1971), Handorf (1973), Lambrecht (1972), and Lambrecht (1971)]."

"Previous research has shown that aptitude for and study of a foreign language is a positive predictor of shorthand success [Curley (1974), Ellington (1973), Gallion (1971), and Lambrecht (1972)]. However, the variable "Foreign Language" in this study is the native language of the students who may not have perfected their knowledge of English because of the pervasive influence of a foreign language at home. The students may not have "studied" the foreign language."

Previous reports in this series, dated February 1976, July 1976, and February 1977, all by Eleanor Ann Heins, Eileen DeDea, and Theodore G. Brough, are availbale from the Educational Research Information Center (ERIC), (In Press). A few copies are available from the Dona Ana County Occupational Education Branch, New Mexico State University, Las Cruces, New Mexico 88003.

APPENDIX B

BIBLIOGRAPHY ON SHORTHAND PROGNOSIS

Eldon Johnson, Doctoral Candidate, NMSU

Balsley, Irol W. "Basic Conditions of Effective Shorthand Learning," The Balance Sheet, 65:244-248, March 1975.

No definitive tests are available as yet to measure readiness in shorthand. Data has revealed:

1) Shorthand skill development involves both verbal and performance skills and subskills. The brain functionings involved in these subskills and their intercorrelation is yet to be determined.

2) Note taking and transcribing subskills differ, requiring different criterion measures.

3) A battery of tests is required for prediction.

4) Different shorthand systems require different mental capabilities. Particular predictive measures would likely pertain to one system only.

Halcomb, Anderson and Balsley (1974) utilized the scores on subsections of the Wechsler Adult Intelligence Scale and the Halcomb Psychomoter Battery. A high correlation was found between taking dictation ability and high performance on the Information, Picture Completion, Arithmetic, and Object Assembly subtests on the WAIS.

Curley, Delores B. "The Influence of Attitudes on Results in Shorthand Classes," Business Education Forum, 28:36-38, January 1974.

This article cites a study by Gallion (1971) which concludes that the Turse aptitude test is the best devised predictor of shorthand success. Other good predictors include English and foreign language grades, and other mental ability tests, although no single test, characteristic, or trait is adequate alone.

De Dea, Eileen. "A Study of the Effectiveness of Prognostic Tests and Measures in Predicting Shorthand Achievement," Master's thesis, University of New Mexico, Albuquerque, 1957.

Standard aptitude tests such as the Turse, ERC, Bennett, and DAT were found more related to general abilities than to shorthand competency. Leslie's interest inventory and a phonetic spelling test correlated well with Theory and Brief forms achievement, while spelling tests correlated with transcription skills.

Durso, Mary W. "The Relationship of Receptive and Expressive Functions to Performance in Beginning Collegiate Shorthand," Ph.D. dissertation, Georgia

State University, Atlanta, 1973. Business Education Forum, 29:33, October 1974.

The purpose of this study was to examine the relationship of students' ability to decode, process, and encode auditory and visual stimuli to dictation achievement in beginning collegiate shorthand. Stimuli perception was measured by a series of ten tests, achievement scores by a series of three-minute dictation takes. The factor having the highest correlation with criterion of achievement was the student score on the phonetics test of the auditory-visual battery. Students who had shorthand previously scored significantly higher on this battery than non-shorthand students. Students with lower IQ scores and more errors on the audio-visual tests also scored lower on the achievement criterion. There was marked significance in predicting dictation success by audio-visual stimuli.

Ellington, Allen R. "The Cloze Procedure and Selected Measures as a Means of Predicting Success in First-Year Shorthand," Ed.D. dissertation, The University of Georgia, Athens, 1972. Business Education Forum, 28:40, October 1973.

The Cloze procedure was tested for effectiveness in determining the extent of intelligence scores, modern language aptitude scores, language achievement scores, and grade point averages as single and multiple predictors of shorthand success at the secondary level. The highest single predictors were intelligence scores and Modern Language Aptitude Test scores, which were as strong predictors as all five variables combined.

Gallion, Leona M. "The Teaching of Shorthand and Transcription," The National Business Education Yearbook, No. 9. Washington: National Business Education Association, 1971, pp. 38-39.

In a review of shorthand research to date, the Turse Aptitude Test was found to be more effective than the Byers or Allyn tests. Foreign language aptitude was found to be a strong predictor of dictation and transcription success but not sufficient as a single predictor. The best predictors for first-semester shorthand are grade point average, 9th and 10th grade English grades, and mental ability. A number of measures were suggested, including critical thinking, study habits and attitudes, and clerical speed and comprehension when advising college-level students into beginning shorthand. The writer concludes that a combination of selection factors rather than a single measure is essential for predicting achievement in shorthand.

Handorf, James L. and Holderness, Aubrey E. "Development of a Formula for Predicting Success in First-Year and Second-Year Shorthand," Ph.D. dissertation, University of Northern Colorado, Greeley, 1972. Business Education Forum, 28:42-43, October 1973.

The study attempted to develop predictors of shorthand and transcription success from examining 27 variables. Through regression analysis, the following predictor variables were found to be the strongest for first-year shorthand success: 1) Part 3, Phonetic Spelling of the ERC Stenographic Aptitude Test, 2) the Symbol Writing and Transcription section of the Bennett Stenographic Aptitude Test, 3) the Paired Associates section of the Modern Language Aptitude Test, 4) overall grade point average. Second-year

predictors: 1) Part 1, Speed of Writing of the ERC test, 2) Part 3, Phonetic Spelling of the ERC test, 3) the Symbol Writing and Transcription section of the Bennett Stenographic Aptitude Test, 4) overall grade point average, 5) previous shorthand achievement.

Heins, Eleanor A., Eileen De Dea, Theodore G. Brough, Sandra Strange and Gayle Brown, An Evaluation of the Project: Pilot Course in Century 21 Shorthand, New Mexico State University, Dona Ana County Occupational Education Branch, Las Cruces, February 1976.

Gregg and Century 21 are about equally successful in preparing students. Century 21 has a greater holding power for students who speak a foreign language at home (Spanish).

Holderness, Aubrey, and James Handorf "Predicting Success in First-Year Shorthand," Business Education Forum, 30:11-12, April 1976.

Through testing and multiple regression, 22 shorthand learning factors were isolated and developed into three equations for predicting shorthand success. Four measures were found to be successful in predicting shorthand theory performance and reading ability at the end of one semester and dictation-transcription ability at the end of one year: 1) word recognition from phonetic spelling, 2) symbol writing, 3) nonsense syllable recall, 4) overall grade point average. By administering tests of these measures to random samples of 30 beginning students, high correlations were found between scores and criterion measures given after periods of instruction.

Kinsey, Don R. "Predicting Success in Shorthand," School and Community, 57:23,80, November 1970.

In a comparison of shorthand grades received by students who had taken shorthand with grades received on subtests of the Differential Aptitude Test, accumulative grade point average and the sentence subtest had the highest relationship with shorthand grades.

Lambrecht, Judith J. "Aptitude Testing in Shorthand," Business Education Forum, 27:17-24, October 1972.

This article is drawn from a doctoral study by the author, and includes a review of previous research in the shorthand prognosis area. Over 200 studies since 1912 have dealt with aptitude for shorthand, primarily due to the concern over high attrition rates, and for developing differentiated instruction. A combination of measures is preferred over only one factor, although verbal measures such as English grades, and particularly foreign language grades or aptitudes seem to be the best predictors. Previous grade point averages correlate with shorthand grades but less well with more precise measures. IQ is not a reliable predictor in itself although it may suggest other measures be taken. English skills are more closely related to transcription than to shorthand skills. Vocabulary measures seem to be related to both writing and transcribing shorthand. The Turse Shorthand Aptitude Test (1940) and ERC Stenographic Aptitude Test (1947) are cited

as having value in predicting transcription ability. Segments of these tests seem to be as reliable as the complete batteries. Particular problems in predictive research in shorthand are discussed. A revision of the 1959 Byers' First-Year Shorthand Aptitude Tests is described. The revised test includes three subtests: 1) Disarranged Syllables, 2) Observation Aptitude, and 3) Phonetic Perception. It is found to be particularly effective at the high school level. Aptitude tests may also be useful in individualizing instruction.

Lambrecht, Judith J. "The Validation of a Revised Edition of the Byers' Shorthand Aptitude Test," Ph.D. dissertation, The University of Wisconsin, Madison, 1971. Business Education Forum, 27:42-43, October 1972.

The study revised and revalidated the Byers' First-Year Shorthand Aptitude Tests, developed by Edward E. Byers in 1959.

Moskovis, L. Michael "Shorthand Prognosis: Some Conclusions and Recommendations," The Balance Sheet, 50:252-254, 287, February 1969.

Most researchers agree that various published shorthand and foreign language aptitude tests and measures of general ability are not reliable predictors of success in shorthand. Cumulative grade point average shows the same relationship to other subjects as it does to shorthand, and intelligence scores do not have a high enough relationship to be used alone. Several useful predictors, if used together, include general mental ability, English composition grades, overall grade point average, and personal trait ratings. A doctoral study by the author in 1967 led to several conclusions: Standardized English composition and spelling pretests can identify students with weaknesses which are related to shorthand skill, vocabulary skill is important, and a standardized study habits and attitudes scale can help identify successful shorthand students.

National Secretaries Association (International), "Ten Criteria for the Selection of Stenographic Students," National Secretaries Association (International), Kansas City, Missouri, 1973.

A nationwide survey of secretaries, management, and business education teachers resulted in a rank-ordered list of important criteria for selecting high school stenographic students. The most important was aptitude as measured by clerical and business aptitude tests such as the Minnesota Clerical Test. Other criteria of high importance were: Interest, Ambition, Responsibility, and Skill in reading, writing, arithmetic, and typing. The least important of the ten in the list were school attendance and high school grade point average.

O'Connell, Mary M. and Russel J. Hosler "Predictors of Success in Shorthand," Journal of Business Education, 44:96-98, December 1968.

In a study of 210 high school students enrolled in beginning shorthand, the two factors that correlated the highest with shorthand achievement were overall high school grade point average and scores on the Turse Aptitude Test.

Neither criterion should be used separately in predicting shorthand success; as many factors as possible should be used.

Ranson, James T. and Edgar R. Smith "Symbol Recognition and Shorthand Success," Business Education Forum, 27:28-30, October 1972.

After preliminary instruction, a test of recognizing the basic 25 shorthand characteristics given to potential shorthand students was found to have significant predictive validity for learning shorthand.

Reid, Jayne "Contemporary Research in Shorthand and Its Significance in the Classroom," The National Business Education Yearbook, No. 12. Reston, Va.: National Business Education Association, 1974, pp. 213-221.

Studies from 1954 to 1967 indicate that the variables most highly correlated with shorthand success are specific purpose aptitude tests, grade point average, achievement test data in reading, spelling, or English grammar, and IQ. More recent studies indicate that personality traits and attitudes bear a relationship to success in beginning shorthand but not for later shorthand and transcription courses.

Rittenhouse, Evelyn J. "A Study of Certain Factors Influencing Success in the Learning and Achievement of Shorthand," Ph.D. thesis, Michigan State University, 1968. Journal of Business Education, 45:30 October, 1969.

This study was concerned with two methods of shorthand teaching, and isolating psychological factors within the learner which may affect shorthand achievement by using selected psychological tests. No value could be found in the tests either singly or as a battery, and no factors determining shorthand success could be isolated.

Skaff, Lorrine B. "The Development and Validation of Predictive Instrument to Measure Student Success in the First Semester of Gregg Shorthand," Ed.D. dissertation, Oregon State University, Corvallis, 1972. "Development of a Shorthand Aptitude Test," Business Education Forum, 27:26-28, October 1972. Business Education Forum, 28:54-55, October 1973.

A predictive instrument was developed and evaluated for first-semester shorthand success. Out of the five parts, phonetic understanding and spelling, and proofreading and punctuation showed the greatest relationships to the first-semester shorthand grade.

Tronsue, Mary E. "A Study of Relationships of Selected Variables with Shorthand Transcription Speed," Ed.D. dissertation, University of Maryland, 1969.

A subsidiary problem investigated within this study was to determine interrelationships of transcription speed and 1) straight-copy typewriting speed, 2 & 3) scores on the Iowa Tests of Educational Development tests on Correctness and Appropriateness of Expression, and General Vocabulary. Relevant

findings from analysis of variance and regression analysis determined a positive relationship between transcription speed and the three variables, and that straight copy typewriting speed and score on the expression test work more effectively as predictors in conjunction than in isolation.

Utley, Kenneth W. "The Effect of Background Factors on Achievement in Two-Year Shorthand at Selected Universities," Ph.D. study, Ohio State University, 1971. Journal of Business Education, 47:296, April 1972. Business Education Forum, 26:55, October 1971.

The purpose of this study was to determine what effect selected background factors have on students' achievement in second-year shorthand, in order to prepare recommendations for counseling purposes. Complete data were secured for 150 students enrolled in second-year shorthand at eight universities from the students, transcription of a dictation test, and student records. Criterion of achievement was the final grade. 92% of the grades were correctly predicted within one letter grade. Conclusions: Use of a dictation test, ACT English and Composit test scores, and grade-predictor formula are useful predictors. Office experience factor was a limited predictor.

West, Leonard J. Research on Teaching Business and Commercial Subjects, New York: City University of New York, New York Division of Teacher Education, January 1971. ERIC: ED 051 377.

In a review of related research, the writer notes Freiberg's (1968) finding that IQ above 110 was a strong predictor of success in shorthand training. In other research, grade point averages and English course grades are found to be pertinent predictors.

OTHER ARTICLES NOT CITED

Cullinane, Donna "A Comparative Analysis Among Theory Achievers in First-term College Shorthand," M.S. thesis, University of Wisconsin, 1973.

Cwierz, Helen A. "The Relationship of the Turse Shorthand Aptitude Test, I.Q., and English Grades to Success in Beginning Shorthand," M.Ed. thesis, Indiana University of Pennsylvania, 1968.

Forkner, Hamden L. "Research and the Future of Shorthand Systems," Kansas Business Teacher, 23:3-5, December 1969.

Freiberg, Foster "A Study to Determine the Validity of Administering a Stenographic Aptitude Test at Medford High School," M.S.T. thesis, Wisconsin State University at Eau Claire, 1968.

Grant, Carmella B. "The Relationship of Certain Test Batteries and Course Grades to Success in Shorthand," M.S. thesis, University of Maryland, 1971.

Halcomb, Charles, Robert Anderson, and Irol Balsley "A Psychological Battery Approach to the Assessment and Evaluation of Shorthand Skills," Texas Tech University, 1974.

Moskovis, L. Michael "An Identification of Certain Similarities and Differences Between Successful and Unsuccessful College Level Beginning Shorthand Students and Transcription Students," Doctor's thesis, Michigan State University, 1967.

Moskovis, L. Michael "Similarities and Differences of College-level Successful and Unsuccessful Shorthand Students," Delta Pi Epsilon Journal, 12:12-16, February 1970.

Nanassy, Louis "Current Research in Shorthand/Transcription," Century 21 Reporter, Fall 1974.

Shapiro, Sandra R. "The Prediction of Success in Shorthand I Based on the Academic Promise Test, Nelson-Denny Reading Test, and English I Grades at Lincoln High School, Jersey City, New Jersey," M.A. project, Montclair State College, 1972.